

**Notice of Allowability**

Application No.

10/710,784

Examiner

Brook Kebede

Applicant(s)

CHANG ET AL.

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03 August 2004.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☒ The drawings filed on 03 August 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**DETAILED ACTION**

***Allowable Subject Matter***

1. Claims 1-9 are allowed over prior art of recode.

***Reasons for Allowance***

2. The following is an examiner's statement of reasons for allowance:

The prior art of record neither anticipates nor renders obvious the claimed subject matter of the instant application as a whole either taken alone or in combination, in particular, prior art of record does not teach "removing the exposed tunnel oxide layer and forming a conformal first dielectric layer over the substrate," as recited in claim 1.

Claims 2-9 also allowed as being dependent of the allowed independent base claim.

Re claim 1, Lin et al. (US/6,391,719) disclose method of forming trench split gate flash memory the method includes providing substrate; forming a trench in the substrate using a patterned mask layer; forming a tunnel oxide layer liner inside the trench; forming a first conductive layer over the tunnel oxide layer inside the trench, wherein the height of the first conductive layer is lower than the top surface of the substrate; forming a conformal gate dielectric layer over the first conductive layer and the tunnel oxide layer and forming a second conductive layer over the gate dielectric layer.

However, Lin et al. do not fail to disclose removing the tunnel oxide layer removing the exposed tunnel oxide layer and forming a conformal first dielectric layer over the substrate.

Similarly, Lee et al. (US/5,773,343) disclose method of fabricating trench flash memory device. However Lee et al. fail to teach removing the tunnel oxide layer removing the exposed tunnel oxide layer and forming a conformal first dielectric layer over the substrate.

Therefore, both Lin et al. and Lee et al. do not teach removing the tunnel oxide layer removing the exposed tunnel oxide layer and forming a conformal first dielectric layer over the substrate during fabrication of trench flash memory device either taken or in combination.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure Iida (US/5,392,237) and Hong (US/5,429,970) also disclose similar inventive subject matter. However, prior art does not teach removing the tunnel oxide layer removing the exposed tunnel oxide layer and forming a conformal first dielectric layer over the substrate during fabrication of trench flash memory device either taken or in combination.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Correspondence***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (571) 272-1862. The examiner can normally be reached on 8-5 Monday to Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2823

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BK

November 14, 2004

  
Gik Chaudhri  
Supervisory Patent Examiner  
Technology Center 2800